



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,693	01/03/2006	Hiroaki Koyama	CSP-115-A	8753

21828 7590 10/12/2007
CARRIER BLACKMAN AND ASSOCIATES
24101 NOVI ROAD
SUITE 100
NOVI, MI 48375

EXAMINER

LIN, KUANG Y

ART UNIT	PAPER NUMBER
----------	--------------

1793

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

10/12/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

cbalaw@gmail.com
cbalaw@ameritech.net
wblackman@ameritech.net

Office Action Summary	Application No. 10/532,693	Applicant(s) KOYAMA ET AL.	
	Examiner Kuang Y. Lin	Art Unit 1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 6, 10, 14 and 16-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6, 10, 14 and 16-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Art Unit: 1725

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-3, 6, 10, 17-19 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-060,845 and further in view of JP 10-204,610.

JP '845 shows a method for prolonging service life of the casting die by maintaining the compressive residual stress of a die cavity surface for more than 1000 MPa (see [0003], [0028]) through a shot-peening and a nitriding process. Thus, JP '845 substantially shows the invention as claimed except it does not use the nitrosulphurizing process for coating the die surface and does not disclose the surface roughness. However, JP '610 shows to use the nitrosulphurizing process to form a coating layer on the die surface to prevent seizure in a die by forming a dense coating layer having a lubricating effect and a

Art Unit: 1725

thermal insulating effect and to improve the service life of the die by forming a nitrided layer containing iron sulfide on the die cavity surface. It would have been obvious to further include the iron sulfide of JP '610 in the nitrided layer of JP '845 by using the nitrosuphurizing process of JP '610 in view of the advantage. With respect to the roughness of the cavity die surface, in [0015] of JP '845 it discloses to perform shot peening before and after the nitriding treatment. Also, in [0025] it further discloses to use carborundum with a diameter of 50-100 micrometers and a injection pressure of 0.3 MPa for peening treatment of the die surface before the nitriding treatment and use glass beads with a diameter of 1-50 micrometers and a injection pressure of 0.4 MPa for peening treatment of die surface after the nitriding treatment. The process parameters of the peening process of JP '845 is similar to that of instant process. Thus, it is expected that the surface roughness of JP '845 will be the same as that of instant application. With respect to claim 3, it is conventional to use chrome molybdenum steel for making casting die as acknowledged by applicant as set forth in [007] of the instant specification. With respect to claim 19, it would have been obvious to obtain the optimal temperature range in the process chamber through routine experimentation.

4. Claims 14, 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-060,845 in view of JP 10-204,610 as applied to claim 1 above, and further in view of US 6,546,968 to Nakagawa et al. for the same reasons as set forth in the previous office action.

Namely, Nakagawa et al. discloses that the atmosphere during nitriding treatment, instead of nitrogen gas, can be a nitrogen compound gas such as ammonia gas or the like or hydrogen gas. When the ammonia gas is used, the rate of nitriding reaction can be increased. At this time, by using together such gases as hydrogen, nitrogen, argon or the like, the rate of nitriding reaction can be controlled. Thus, it would have been obvious to further provide the hydrogen gas and ammonia gas of Nakagawa et al. in the nitriding process of JP '845 or nitrosuphurizing process of JP '610 such that to better control the nitriding or nitrosuphurizing reaction.

5. Applicant's arguments filed September 17, 2007 have been fully considered but they are not persuasive.

a. Applicant in page 9, 1st paragraph of the response stated that JP '845 does not disclose the compound diffusion layer containing both iron sulfide and iron nitride or that a sulphonitriding treatment is applied to surface of the casting die. However, as the sulphonitriding treatment of JP '610 is used in the JP '845 the coating layer will be the compound diffusion layer containing both iron sulfide and iron nitride.

b. Applicant in page 9, 3rd paragraph of the response stated that forging die requires thermal insulating properties, whereas a casting die does not and it would not have been obvious to apply the sulphonitriding treatment of JP '610 forging die to the casting die of JP '845. However, it is a common knowledge that the iron nitride layer of JP '845 also has insulating properties. Thus, the

disclosure of JP '610 that forging die requires thermal insulating properties does not render the combination of both prior art teaching unobvious, i.e. it does not teach away to adapt the teaching of JP '610 in the process of JP 845.

c. Applicant in page 9, last paragraph through page 10, 3rd of the response stated that since JP '845 does not disclose lubrication, it does not have seizure problem. However, as stated in the previous office action that it is a common practice in the die casting art to lubricate the die surface such that to prevent seizure problem (for example, see US 4,762,163). Thus, it would have been obvious to apply the sulphonitriding treatment of JP '610 in the die of JP '845 to prevent the seizure problem without applying the additional lubricating step.

d. Applicant in page 11, 4th paragraph through page 12, last paragraph of the response stated that none of the cited prior art references teach or suggest a casting die having a surface roughness of less than 8 micrometer. However, as stated in paragraph 3 supra that since in [0015] of JP '845 it discloses to perform shot peening before and after the nitriding treatment. Also, in [0025] it further discloses to use carborundum with a diameter of 50-100 micrometers and a injection pressure of 0.3 MPa for peening treatment of the die surface before the nitriding treatment and use glass beads with a diameter of 1-50 micrometers and a injection pressure of 0.4 MPa for peening treatment of die surface after the nitriding treatment. The process parameters of the peening process of JP '845 is similar to that of instant process. Thus, it is expected that the surface roughness of JP '845 will be the same as that of instant application.

Art Unit: 1725

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kuang Y. Lin whose telephone number is 571-272-1179. The examiner can normally be reached on Monday-Friday, 10:00-6:30,.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jonathan J. Johnson can be reached on 571-272-1177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kuang Y. Lin/
Primary Examiner
Art Unit 1725

9-28-07